

There should be a system comprising 'incentives' to encourage production performance from captive coal blocks and 'disincentives' to discourage non-performance. The set of such 'incentives' should include tying up of exploration and development before allocation, to ease preparation and approval of mining plan. The Central Government and the State Governments should adopt a well-coordinated and planned approach towards granting of various approvals such as mining lease, mining plan, forest clearance, environment management plan, and land acquisition so that these approvals are granted within the timeframe stipulated in the MoC guidelines. Similarly, there should be a strong set of 'disincentives' in the form of increased financial stakes of the allottees at the time of allocation; strong monitoring in respect of achievement of milestones and use of produced coal; and de-allocation and penalties in case of non-performance.

Conclusion

In essence,

- While allocation procedure involved the issues of 'objectivity' and 'transparency' in the selection process, a system comprising 'incentives' to encourage production performance and 'disincentives' to discourage non-performance was required for augmenting coal production in the country from the captive coal blocks.
- As brought out above, the procedure followed for allocation of coal blocks lacked transparency and it failed to arrive at the optimal price at which allocation of blocks should have been made. The allocation of excess coal and permission to use the surplus coal in other projects of RPL (Sasan) gave undue benefits to RPL over others.
- As far as 'incentives' were concerned, the allottees already had substantial 'windfall gains' on account of substantial difference between the price of coal supplied by CIL and the cost of coal produced through coal blocks allocated for captive mining. This windfall gain would have, however, accrued to them only after production commenced.
- Out of 86 coal blocks which were scheduled to produce in the Eleventh Plan period (upto 2010-11), only 26 blocks (including 15 blocks allocated to private sector) started production as of 31 March 2011.
- This would imply that either some of the allottees were non-serious about production

and/or the set of 'incentives', which was required to help expedite commencement of production, was not available.

- Most of the delays were on account of delays in land acquisition and in grant of various approvals like mining lease, mining plan, forest clearance, environment management plan. Hence, 'incentives' should have involved a well-coordinated and planned approach by the Central Government and the State Governments towards granting of various approvals such as mining lease, mining plan, forest clearance and environment management plan, and land acquisition so that these approvals were granted within the timeframe stipulated in the MoC guidelines.
- Similarly, there should have been a strong set of 'disincentives' in the form of increased financial stakes of the allocattees at the time of allocation; strong monitoring in respect of achievement of milestones and use of produced coal; and de-allocation and penalties in case of non-performance.

Chapter 6: Production Performance of CIL

It should be the endeavour of CIL and its subsidiaries to ensure that they meet the planned targets of production and supply of coal, as fixed by the Planning Commission so that the demand for coal in the country is met to a large extent through domestic supplies and the user companies, especially those in the power sector, do not suffer on account of shortage of coal.

Some of the important performance parameters that CIL and its subsidiaries need to achieve to meet their production targets and supply commitments are as follows:

- *Proving of coal reserves and enhancing drilling capacity to prove reserves.*
- *Removal of overburden and coal production in open cast mines.*
- *Coal production in underground mines.*
- *Production of washed coal through washeries.*
- *Transportation of coal.*
- *Availability and utilization of equipment.*
- *Manpower productivity.*
- *Execution of coal projects.*

These aspects are covered in the Results Framework Document (RFD) for Ministry of Coal (MoC) and Memorandum of Understanding (MoU) of CIL and its subsidiaries with MoC.

This chapter analyses the efforts of CIL and its subsidiaries and MoC towards augmenting coal production in the country, based on the above performance parameters.

6.1 Authenticity of Coal Reserves

India computes its coal inventory on the basis of the Indian Standard Procedure (ISP) code of 1956. ISP is purely a geological resource classification system without assessment of mineability. The ISP addresses only the volume and tonnage, i.e. the resource of coal but not the accuracy of structural delineation, which would ensure that the reserves are actually economically and technically amenable to extraction.

Mining of coal with the present state of technology either currently or in the near future is not likely to go beyond 300 metre depth. However, as per ISP, coal up to 1,200 metre has been considered in the reserve estimation.

Moreover, India's reported reserves of coal continue to be cumulative and gross and include coal that has already been extracted and used, estimated to be about 10 billion tonnes (BT) in the past 200 years.

CIL gave its resource estimates as also those of a third party, i.e. SRK Consultants of UK in its Red Herring Prospectus issued (August 2010) to SEBI for its Initial Public Offering. While CIL's resource estimates were based on ISP code, those of the Consultant were based on the Australasian Code for Reporting of Exploration Results, Mineral Resource and Ore Reserves (JORC Code). Although the Consultant did not independently verify the technical information provided by CIL, the differences in estimates were significant.

As per CIL, out of a total resource of 64.22 BT in its command area, 51.33 BT (79.93 per cent) was categorised as 'proved', 9.92 BT (15.45 per cent) were 'indicated' and 2.97 BT (4.62 per cent) were 'inferred'²⁹ reserves. The extractable coal was, however, assessed by CIL at 22.34 BT as of April 2010. As per the Consultant, the extractable coal as per JORC Code was only 18.86 BT (10.60 BT categorised as 'proved' and 8.26 BT as 'probable').

The Government of India took a decision (May 2001) to do away with ISP and implement the internationally accepted system of United Nations Framework Classification (UNFC) for minerals. UNFC lays down a standard procedure for calculating the size of reserves and resources based on a three-dimension system with technical feasibility, economic viability and geological estimates. However, no action was taken till the PMO directed (April 2007) MoC to examine the issue of current ISP procedure vis-à-vis UNFC. CMPDIL undertook (April 2007) a project for converting the existing system of coal resource classification to UNFC, which was to be completed by March 2012. The project is yet to take off (February, 2012).

Ministry stated (February 2012) that CMPDIL has started the job of classifying coal resources as per United Nation Framework Classification System and the draft report is scheduled to be submitted in March 2012.

In fact, the impact of the changeover from ISP to UNFC code on the national mineral inventory is expected to be significantly realistic and CMPDIL should urgently carry out this exercise so as to ensure more reliability in the extractable coal estimates in the country.

6.2 Inadequate drilling capacities for proving reserves

Rapid increase of coal production requires accelerated exploration, which in turn requires augmentation of drilling capacity and capacity to assess coal reserves and prepare geological reports. As brought out earlier, the Government had appointed (December 2004) an Expert Committee to prepare a comprehensive road map for the modernisation of the coal sector under

²⁹ Based on regional and promotional exploration where the boreholes are normally placed 1-2 km apart.

chairmanship the of Shri T. L. Sankar (Expert Committee). The Expert Committee also suggested (December 2005) that MoC must launch a programme of detailed exploration and drilling in the Eleventh Plan, aimed at increasing 'proved' category reserves by increasing the drilling capacity of CMPDIL from 3 lakh metres per annum to at least 15 lakh metres per annum by involving all eminent agencies within the country and outside.

Audit observed that an outlay of ₹ 383.50 crore³⁰ was proposed in the Eleventh Plan under the Central Sector Plan Schemes for promotional exploration for drilling of 7.50 lakh metre comprising 4.00 lakh metre for coal in CIL blocks to establish about 20 BT of coal and 3.50 lakh metre in Lignite to establish 4.06 BT of Lignite resources. Similarly, in case of non-CIL blocks scheme, about 10 lakh metre of drilling was proposed to be undertaken in 32 non-CIL blocks during the Eleventh Plan to bring 10.75 BT of resources to be brought under 'proved' category. The total fund requirement for detailed exploration was estimated at ₹ 893.89 crore. Against the above requirement, an outlay of ₹ 523.08 crore (revised) was approved by MoC in the 11th plan and a sum of ₹ 324.22 crore was released by MoC till January 2012 for drilling in non-CIL blocks.

The performance of exploratory drilling by CMPDIL and others in the Eleventh Plan is given in Table-6.2.

Table-6.2
Targets and achievements of drilling

(Figures in lakh metre)					
Agency	Target in the XI plan	Actual till 2010-11	Proposed addition in 2011-12	Actual and proposed during XI Plan	Shortfall
A. Detailed drilling by CMPDIL (including promotional drilling)					
MECL		3.61	1.04	4.65	
GSI		0.81	0.19	1.00	
CMPDIL		0.12	0.10	0.22	
DGMs (Nagaland and Assam)		0	0.01	0.01	
Total A	7.50	4.54	1.34	5.88	1.62
B. Central Sector Scheme (Non-CIL)					
CMPDIL (Departmental)		2.49	0.70	3.19	
Outsourcing		3.23	1.40	4.63	
Total B	13.70	5.72	2.10	7.82	5.88
Total A + B	21.20	10.26	3.44	13.70	7.50

As would be seen from the above, there would be a shortfall in achievement by 1.62 lakh metre of drilling (CIL blocks) and 5.88 lakh metre of drilling (non-CIL blocks) vis-à-vis the targets of the Eleventh Plan. As of March 2011, 18.28 BT of coal resource was established. However, the drilling

³⁰ Coal and lignite

capacity of CMPDIL was expected to be 3.44 lakh metre in 2011-12 as against the target of 15 lakh metre per annum as suggested by the Expert Committee.

The Ministry stated (February 2012) that in case of Regional Exploration (Promotional) against a target of 7.47 lakh metre of drilling (revised estimate), 5.30 lakh metre was achieved upto January 2012. The expected achievement at the end of Eleventh Plan is 5.69 lakh metre. The shortfall of 1.78 lakh metre in drilling is stated to be on account of not getting forest clearance despite sincere persuasion by CMPDIL.

Ministry further added that as regards detailed exploration in Non-CIL blocks, CMPDIL submitted a scheme to undertake 13.50 lakh metre of detailed drilling against the budgeted estimate of Rs.893.89 crore. The likely achievement (other than outsourcing) was 7.62 lakh metre of drilling against the target of 7.12 lakh metre (revised estimate). Under outsourcing of drilling work of 18 blocks involving 7.28 lakh metre of drilling was proposed to be completed in three years time after awarding the contract in 2008-09. The achievement (upto January 2012) was 4.97 lakh metres. Thus a balance of 2.31 lakh metre of drilling was required to be completed in the last two months of the terminal year of Eleventh Plan. Less progress in drilling was due to non-clearance of forest land. It was further stated that enhancement of departmental capacity through expansion and modernisation has been taken by introduction of mechanical equipment and additional drills.

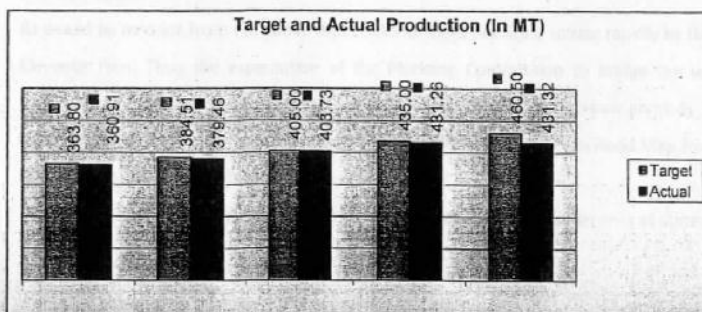
In respect of drilling in CIL areas, it was proposed to drill 5 lakh metre in the Eleventh Plan against which 11.2 lakh metre of drilling is likely to be achieved.

In brief, the fact remains that CMPDIL needs to increase its drilling capacity of non CIL blocks as also deploy other agencies for accelerated exploration, assessment of coal reserves and preparation of geological reports.

6.3 Production of Coal by CIL during the Eleventh Plan

The Company's achievements vis-à-vis targets of production for the five years ending 31 March 2011 are given in Chart 6.3.

Chart 6.3

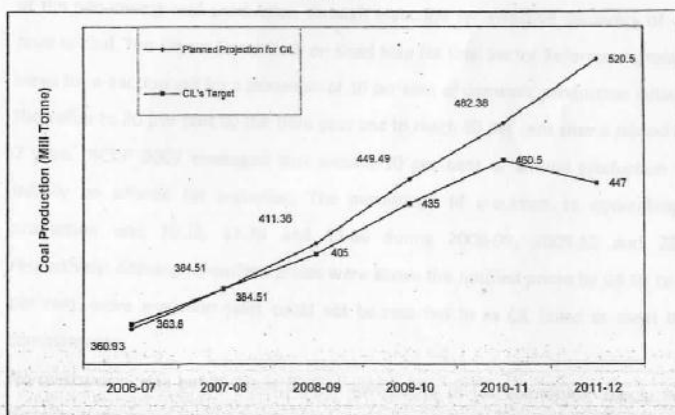


As would be seen from the above, the annual production of CIL has been more or less in line with the targets during 2006-07 to 2010-11. The annual production ranged between 98.69 per cent and 99.69 per cent of the targeted production during 2006-07 to 2009-10. The annual production, however, decreased to 93.66 per cent of the target in 2010-11.

6.4 Lower targets of production fixed

The targets fixed by CIL during the Eleventh Plan period were not commensurate with those envisaged by the Planning Commission. As a result, although CIL more or less achieved its annual targets of production, but it was short of targets of the Planning Commission by 73.50 MT and 39.50 MT as per the original and revised targets, respectively. Against an envisaged growth rate of 42.88 per cent (original) and 33.73 per cent (revised), the actual growth in production was only 23.85 per cent. Even after lowering the target of production by the Planning Commission in the mid-term appraisal, the target fixed by the Company for 2011-12 would be lower by 9.88 percent. The details are shown in Chart 6.4.1.

Chart 6.4.1



As per the annual plans of MoC, the main reasons for fixation of lower coal production targets were delays in Environment and Forest clearances and non-availability of sufficient numbers of railway wagons.

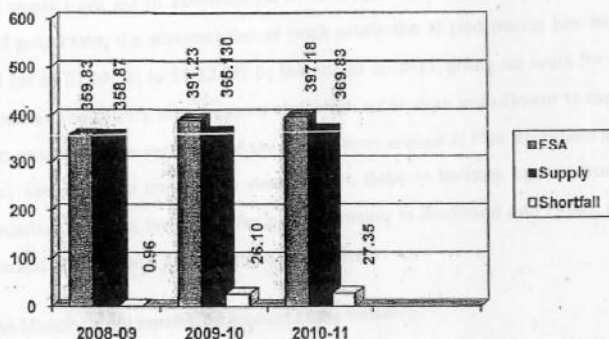
As would be evident from the above that coal shortages are likely to rise rapidly by the end of the Eleventh Plan. Thus the expectation of the Planning Commission to bridge the widening gap between demand and supply through unprecedented capacity expansion plans as well as CIL's Emergency Production Plans as visualised by the Expert Committee on Road Map for Coal Sector Reforms (December 2005) seems to be farfetched.

The targets and achievements did not help CIL to meet its FSA commitments as stated below:-

- During the years 2008-09 to 2010-11, CIL failed to supply 54.41 MT of coal as per the FSAs during the period between 2008-09³¹ and 2010-11 as depicted below:-

Chart-6.4.2

Shortfall in supply of coal against FSA



- Audit further observed that the Planning Commission proposed to sell at least 20 percent of the non-coking coal production through e-auction for effective discovery of market price of coal. The Expert Committee on Road Map for Coal Sector Reforms expressed the views for e-auction sell for a minimum of 10 per cent of domestic production initially and thereafter to 20 per cent by the third year and to reach 30 per cent over a period of 5 to 7 years. NCDP 2007 envisaged that around 10 per cent of annual production would initially be offered for e-auction. The percentage of e-auction to non-coking coal production was 10.72, 11.39 and 11.66 during 2008-09, 2009-10 and 2010-11 respectively. Although e-auction prices were above the notified prices by 58.10 to 80.70 per cent, more e-auction sales could not be resorted to as CIL failed to meet its FSA commitments.
- No mechanism was put in place by the subsidiaries of CIL to monitor supply of coal through state nominated agencies for verification of end use of coal as envisaged in NCDP. This non-verification of credentials not only defeats the objectives of NCDP for distribution of coal to small and medium consumers in a transparent and effective manner, but is also fraught with the risks of diversion and sale in the black market.

The Ministry stated (February 2012) that the production target is fixed by Planning Commission on the basis of assessed demand of coal from various stakeholders such as Power, Steel and other

³¹ The earlier years of Eleventh Plan have not been mentioned as the system of linkage was replaced by FSA in October 2007 as per NCDP 2007.

sectors. The projected level of power generation reduced from 100000 MW in the beginning of the XI Plan period to about 70000 MW, causing decrease in demand of coal. The targets of production are fixed keeping in view the actual performance of previous years with an expected growth rate. Had the production been to the level of what was projected by the Planning Commission, it would have led to accumulation of coal stock at pithead only. Even with the reduced rate of production, the accumulation of stock within the XI plan period has increased from 45.60 MT (as on 01.04.08) to 69.17 MT by the end of 2010-11, giving no room for further production. However, there were other reasons also which acted as an impediment to expansion of new projects resulting in the variations of the targets from original XI Plan document and Mid Term Appraisal, like, embargo imposed in view of CEPI, delay in forestry and environmental clearance, evacuation problem, law and order problem mainly in Jharkhand and Orissa, delay in land acquisition and rehabilitation and resettlement problems.

The reply of the Ministry is not tenable on account of the following-

- CIL failed to meet the FSA commitments which has gradually increased over the years
- In fact, MoC's concern of accumulation of stock at pit-head due to non-supply of rakes could be addressed through proper coordination with railways as CIL has developed an institutional mechanism with Railways for increasing supply of rakes at sidings. (MOC reply to para 5.9 refers)
- There had been large imports of non-coking coal over the years due to less cost of imported coal in the coastal areas.
- The reform and restructuring as well as bridging the short to medium term gap between demand and supply would strongly depend on rationalizing the principles and procedures of determining the price of coal to different users of coal. In fact, even the Expert Committee on Road Map for Coal Sector Reforms (December 2005) had expressed the views on the same line.

The Ministry while responding (February 2012) on the verification of erstwhile non-core sector consumers stated that a mechanism was put in place to get *bona fide* use of coal by them from the State Governments. However, Government of Maharashtra informed that while their Industries Department would be able to certify the existence of such industries who are getting/drawing coal from CIL sources, it may not be possible to certify the *bona fide* use of coal by such consumers. Recently, Central Coalfields Limited, one of the subsidiary company of CIL has introduced the system of verification of documents from such consumers. It was decided that the efficacy or implementation of this system may be obtained from CCL and based upon the same, a decision on the system of verification of consumers would be decided by the Ministry.

6.5 De-reserving of CIL blocks

CIL carried out an exercise in 2004 for identification of coal blocks required for maintaining the production at the Eleventh Plan level upto 2036-37. A total of 289 additional blocks were identified. The total reserves to be retained by CIL, together with the then existing mines and projects, worked out to around 93 BT.

Based on the suggestions of Shri Ratan Tata, Chairman, Investment Commission on initiatives in the power sector, the Energy Coordination Committee under the chairmanship of the Hon'ble Prime Minister decided (February 2006) that since out of 289 coal blocks (229 explored and 60 unexplored) reserved for CIL till then, only 150 blocks were planned for production by CIL upto 2011-12, in the interest of increasing the supply of coal in the country, some of the 79 coal blocks which were explored in detail should be made available to NTPC and others for mining.

The Secretary, MoC advised CIL to retain only those blocks which were projected for production by the terminal year of the Eleventh Plan and relinquish the remaining blocks for captive allocation.

MoC de-reserved (May 2006) 48 CIL blocks with 9.22 BT of coal reserves (40 explored with GR of 5.83 BT and 8 unexplored with GR of 3.39 BT) for captive allocation. This together with 5 CIL Blocks allotted (January 2006) to NTPC and two blocks (Mohar allotted in September 2006 and Chhatrasal allotted in October 2008) to Sasan UMPP led to a further release of 3.78 BT of coal reserves from CIL. After the de-reservation of the above blocks, CIL was left with around 81.50 BT of coal reserves.

Audit examined the status of these 48 blocks as of June 2011, which were de-reserved from CIL and found the following:

- Nine blocks remained un-allocated, three were de-allocated after allocation.
- Nine blocks were yet to commence production where normative production date was over.
- In the case of balance 27 blocks, normative production schedules were from July 2011 to April 2014.

Contrary to the expectations of the Energy Coordination Committee for earlier realisation of production potential offered by these proven coal reserves, no production could take place. While CIL had to relinquish these coal blocks, no production could materialize from these blocks.

As mentioned earlier, CIL was already working on an 'Emergency Production Plan' in the Tenth Plan to meet the surge in the demand of coal by advancing the production schedule in 12 existing mines/ ongoing projects and by taking up four new projects through outsourcing production of

coal and removal of overburden. With the de-reserving of CIL coal blocks for captive mining, it was imperative that the requests of CIL for additional blocks were considered on priority.

Audit, however, observed instances where requests of CIL for additional blocks were not acceded to/acted upon by MoC. These are discussed below:

- In order to meet the future demand of coal, CIL requested (August 2008) MoC to allocate 138 blocks with reserves of 57.57 BT. This was revised (September 2011) by CIL to 116 blocks with 49.79 BT of GR. Final decision of MoC was however awaited i.e. even after a lapse of two years from initial proposal of CIL. This would adversely affect the future production plan of CIL.
- MoC allocated (November 2008) Rajhara North block for captive mining by de-reserving from CIL despite the request made (January 2008) by CIL for not de-reserving the block, which created a surplus of more than 400 employees and hence a burden for CIL.
- Similarly, MoC allotted (October 2009) Moira Modhujore North block for captive mining which was inadvertently included in the list of blocks for allotment to other players and the request of ECL not to de-reserve was turned down (January 2008) by MoC. At the time of de-reservation, ECL had already worked partially in the block and it was also necessary for ECL to increase its production substantially under the revival package (November 2004) of BIFR.
- The Behraband North and Vijay Central coal blocks under mining lease of SECL were de-reserved from CIL. These blocks were having the prospects of being developed as a highly mechanized high capacity underground mine for SECL. The Behraband North block was operated by SECL before de-reservation. The above blocks had not been allocated by MoC so far (November 2011) even after a lapse of more than three years which in any case, defeated the purpose of de-reservation of these blocks from SECL.

The Ministry stated (February 2012) that the proposal to de-block the coal blocks which were not part of the plans of CIL till 2026-27 is only a recommendation of the Expert Committee constituted to give a report on the reforms in coal sector whereas identifying the blocks which are to be mined by CIL in the 12th plan period and beyond for allocation is the decision of Energy Coordination Committee (ECC) which was meant to improve the availability of power.

Ministry further added that the revised list of blocks requested by CIL for allocation is under consideration of the Government and that these blocks are not likely to come into production during 12th or 13th plan periods. As far as coal blocks- Rajhara North, Moira Modhujore, Behrabandh North and Vijay Central are concerned, it added that these blocks were identified

by CIL/CMPDIL themselves in pursuance of the decision of ECC, which were not likely to come into production by 12th plan, for allocation for captive purposes. Further, there is delay in allocation of Behrabandh North and Vijay Central coal blocks due to court cases. The Vijay Central coal block has been allotted to CIL/SECL as leader in leader-associate model on 01.11.2011.

The contention of the Ministry is not acceptable on account of the following:

- CIL had stated (March 2006 and August 2008) that the idea of releasing blocks not required by CIL for production purpose upto the end of XI plan was not in the best interest of CIL or the country.
- Study carried out by CIL in 2006 depicted that the production from the blocks available with CIL would attain a peak of 664 MT in 2016-17 and thereafter, would decline to 642 MT in 2021-22 and 619 MT in 2026-27. The decline would accelerate after 2026-27 due to exhaustion of existing mines and completed project resources.
- The de-reservation of CIL blocks was against the recommendation of the Expert Committee on Road Map for Coal Sector Reforms (December 2005) which advocated de-reservation of CIL blocks that cannot be put into production before 2026-27.
- The ECC took a decision (February 2006) on the basis of which the said 48 blocks were carved out from CIL just after the submission (December 2005) of the report by the Expert Committee with a view to improve the availability of power. In fact, our audit has clearly brought out that de-reservation has not yielded any result so far.
- As per NCDP 2007, CIL has to meet coal demand of all the customers in India as per the extant rules given in the policy even by resorting to imports. In fact, CIL had stated (August 2008) that even import of coal arising from widening gap between demand and domestic availability of coal would not be feasible due to constraints of port, infrastructure and availability of coal in international market. The task would be more onerous in view of the fact that several explored blocks with substantial reserve which could have contributed to production expeditiously were taken away from CIL and it would now have to increase production from unexplored blocks which would take longer time to develop. Incidentally, after de reservation of 48 CIL blocks, CIL demanded for additional 138 unexplored blocks (approximately 57.57 BT geological reserves) in August 2008 which is under consideration of MoC.

6.6 Production performance of open cast mines

In open cast mines, mining starts with the removal of overburden (OB) i.e. top soil. Benches are constructed containing exposed coal seams. Holes are drilled in the coal seams and explosives are charged in the hole and blasted. The fragmented coal is then mined through shovel and

transported through dumpers (dumper-shovel combination) for crushing, eventual storage and despatch. In select open cast mines, mining is done by special equipment called surface miner, where the exposed coal is mined and crushed simultaneously for direct despatch to the loading points.

During the period from 2006-07 to 2010-11, open cast mines contributed 88 to 90 percent of the total production of CIL. The performance of the open cast mines of CIL during the above period are given in Table 6.6.

Table 6.6
Targets and achievements of open cast mines

(Figures in MT)

Company	2006-07		2007-08		2008-09		2009-10		2010-11	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
ECL	22.57	22.20	23.18	15.74	20.34	19.74	21.75	21.83	24.20	23.43
BCCL	19.59	19.30	20.62	20.75	21.50	21.38	23.45	23.61	24.75	25.31
CCL	39.97	39.36	42.00	42.32	44.74	41.68	46.05	45.61	48.34	46.25
NCL	52.00	52.16	58.00	59.62	61.25	63.65	66.50	67.67	72.00	66.25
WCL	32.10	33.30	32.39	33.53	32.75	34.59	34.85	36.12	36.35	34.95
SECL	71.00	72.30	74.04	77.05	78.00	83.58	88.50	90.18	93.50	95.90
MCL	77.59	78.03	85.60	85.89	96.11	94.19	107.20	101.88	114.46	98.11
NEC	0.90	0.94	1.70	1.01	1.02	0.96	1.20	1.11	1.25	1.10
CIL	315.72	317.59	337.53	335.92	355.71	359.77	389.50	388.01	414.15	391.30

It would be seen from the above that there had been continuous rise in production of coal from the open cast mines by CIL. However, there was an aggregate shortfall of production in ECL by 9.1 MT, CCL by 5.88 MT and MCL by 22.86 MT during 2006-07 to 2010-11.

The Ministry stated (February 2012) that the aggregate shortfall in production in the mines of ECL, CCL and MCL was mainly due to severe land acquisition and rehabilitation problems. Moreover, due to coal evacuation problems (supply of rakes) in some growing coalfields i.e., North Karanpura, Talcher, IB Valley and Mand Raigarh, cost build up of pit head stocks which resulted in restrictions of production in some subsidiaries. However, it is assured that actions would be taken to increase production in opencast and underground mines by introduction of appropriate technology, infrastructure and proper monitoring at every level.

6.6.1 Backlog in Removal of Overburden hindering Production

Exposure to coal in the open cast mines can be accessed only when overburden (OB) is removed. Backlogs in OB removal have significant adverse effect on the present and future production of coal. The performance of the subsidiaries of CIL in removal of OB from 2006-07 to 2010-11 is given in Table 6.6.1.

Table 6.6.1
Targets and achievements in removal of over burden (Figures in million cum)

Company	2006-07		2007-08		2008-09		2009-10		2010-11	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
ECL	51.74	48.78	51.77	39.98	48.66	43.07	52.00	49.74	55.00	56.25
BCCL	52.18	46.25	56.50	50.61	58.00	53.6	59.00	61.63	62.00	83.23
CCL	54.36	45.90	55.00	55.22	58.00	55.63	61.00	56.05	60.00	62.53
NCL	150.00	139.60	206.61	186.25	210.40	202.75	242.00	177.98	248.00	182.21
WCL	141.77	106.33	124.60	113.89	117.90	126.66	124.00	133.97	126.00	115.83
SECL	99.77	87.27	115.66	100.64	106.20	107.00	147.00	129.80	145.00	137.57
MCL	60.00	55.47	66.00	54.56	70.00	51.84	86.00	66.07	74.00	88.70
NEC	8.24	8.06	14.60	6.42	9.65	4.58	9.00	6.79	10.00	5.81
CIL	618.05	537.65	690.74	607.56	678.81	645.13	780.00	682.03	780.00	732.13
Total shortfall	80.40		83.18		33.68		97.97		47.87	

The method adopted by CIL to ascertain the performance in OB removal at the end of a particular year is the quantity by which the actual removal of OB falls short of targeted removal in that year. However, the actual backlog in OB removal on a particular date should be worked out on the basis of cumulative backlog of OB removal. Cumulative OB removal backlog in any specific year is calculated by subtracting total quantity of OB removed till that year from total quantity of OB required to be removed up to that year. -The cumulative backlog in OB removal would exceed the backlog as calculated by CIL since the targeted removal is generally lower as it is based on the existing excavation and transportation capacities and not on the standard ratio (OB to coal) given in the project report. The cumulative backlog also indicates the exact status of mining in an open cast mine.

Test check by Audit in four subsidiaries³² revealed that the cumulative backlog of removal of OB as of 31 March 2011 was 84.70 million cum in ECL, 41.61 million cum in CCL, 297.68 million cum in NCL and 155.37 million cum in WCL, corresponding to 35 MT, 30.82 MT, 108.25 MT and 46.94 MT of coal, respectively. The value of equivalent coal worked out to ₹ 30,461.95 crore.

The reasons for shortfall in OB removal as analysed in audit in the four subsidiaries were found to be as follows:

- Failure of departmental equipments in Rajmahal and labour problems in Sonepur Bazari and Kottadih (ECL).
- Delays in forest clearance and release of land at Konar, North Urimari, Karo and Rohini and due to law and order problems (CCL).
- Sliding of OB benches in Umrer (WCL)

³² CCL, ECL, NCL and WCL

- Delays in award of contracts for removal of OB in Dudhichua, Nighai, Amlohri and Bina; delays in supply of equipment and poor performance of shovels and dumpers; and delays in forests clearance and release of land at Khadia (NCL).

The Ministry stated (February 2012) that backlog of OB is generally calculated on the basis of average Stripping Ratio (S/R). Project Reports (PR) are prepared on the basis of borehole (B/H) data which is also very few in numbers. The total volume of OB and Coal in the project is huge and even a minor variation in the (B/H) data may result in excessive deviation from the project report. It has also been observed that in actual operation of projects, the initial estimates do vary considerably due to variation in Stripping Ratio (S/R) with variation of gradient and nature of surface topography. SR of a project is normally low in the beginning of the project whereas it increases with the advance of working. The project report specifies only one ratio for the entire life of the project which is not correct and needs to be broken down in different stages of working. The present methodology is to calculate the actual requirement of OB to be removed depending upon the situation and as such may not tally with one single figure of SR mentioned in the PR.

Audit analysis, however, revealed that the reasons for shortfall of production of coal in 2010-11 were partly due to huge shortfall in OB removal affecting exposure of coal very adversely. CIL also expressed concern (July 2011) on cumulative backlog in OB removal affecting coal production adversely. CIL should introduce change in the system of working out stripping ratio by breaking down the ratio in different stages of working instead of one single ratio present under the existing system of reporting

CIL may direct its subsidiaries to correct the methodology of calculating the backlog in OB removal and take immediate steps for expediting OB removal. This being very essential factor facilitating augmentation of production of coal needs to be appropriately addressed. In fact in the exit conference (9 February 2012), MOC agreed to include the cumulative backlog of OB removal in the mining plan and associated environmental clearances.

6.7 Production performance of underground mines

In underground mining, holes are drilled and blasted in the exposed coal seams. The blasted materials are mined by conventional or though mechanised/semi-mechanised method and loaded manually or mechanically and brought to the surface from the underground by conveyors and transported for crushing, eventual storage and despatch.

During 2006-07 and 2010-11, seven underground projects with a capacity addition of 2.36 MT were completed with a capital outlay of ₹ 253.01 crore. The production performance of underground mines of CIL subsidiaries from 2006-07 to 2010-11 is given in Table 6.7.

Table 6.7
Targets and achievements of underground mines

(Figures in MT)

Subsidiaries/ CIL	2006-07		2007-08		2008-09		2009-10		2010-11	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual
ECL	10.43	8.27	10.23	8.32	10.66	8.39	9.25	8.23	9.50	7.37
BCCL	5.61	4.90	4.58	4.46	5.00	4.13	4.55	3.90	4.25	3.70
CCI	2.03	1.96	2.00	1.83	2.26	1.50	1.95	1.47	1.66	1.27
NCL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WCL	9.90	9.92	10.01	9.98	10.30	10.11	10.15	9.62	10.15	8.71
SECL	17.50	16.20	17.46	16.74	18.00	17.57	17.50	17.83	18.50	16.80
MCL	2.41	1.97	2.40	2.12	2.89	2.15	2.10	2.20	2.29	2.17
NEC	0.20	0.11	0.30	0.09	0.18	0.05	0.00	0.00	0.00	0.002
CIL	48.08	43.32	46.98	43.54	49.29	43.96	45.50	43.25	46.35	40.02

As would be seen from Table 5.4, production from underground mines has stagnated around 43 MT, which was 9.28 per cent of the total production of CIL in 2010-11.

6.7.1 Underground mines mostly loss-making

Audit observed that out of 273 underground mines, majority are loss making. The loss-making underground mines could not be closed because of difficulties in redeployment of surplus manpower and strong opposition from the trade unions. The most adversely affected subsidiary was ECL, where out of 26 unviable mines, only 11 mines could be closed till 2010-11. The remaining 15 unviable mines were still in operation with aggregate production of only 0.40 MT per annum, thereby sustaining a loss of ₹ 980.87 crore during the last three years ending 31 March 2011.

The Ministry stated (February 2012) that the underground mines are loss making because of huge deployment of manpower. Out of a total manpower 3,74,651 (as on 01.01.2012), 2,01,541 manpower is deployed in producing about 40 million tones from underground mines, representing a share of about 10% of total production. Since wages cost is very high, most of the underground mines are incurring losses except a few which has a high degree of mechanization. In ECL, a number of mines were developed during pre nationalization period and were subsequently reorganized and amalgamated. At the time of preparation of Revival scheme for ECL, an assessment was made to identify those mines which were running in huge losses and as such 26 mines were identified. It is not possible to completely close down all the mines because it

would cause water logging and will create danger for adjoining mines. As such, a minimum deployment for pumping will always be needed.

An effort was made to reorganize the manpower in ECL. The manpower from 11 mines has so far been shifted to other mines for gainful utilization, but there is stiff resistance from unions in reorganization and redeployment of manpower. Efforts are on to find suitable technology for revival of such mines.

6.7.2 Constraints in Technology being used for Underground Mining

Underground mining has been an area of major concern on account of lack of appropriate technology for the geo-mining conditions prevailing in the deeper seated coal deposits. Out of 43 MT of overall production of coal from the underground mines, about 35 MT of coal is mainly produced through Bord and Pillar method by mechanised loading equipment such as Side Discharge Loader (SDL) and Low Haul Dumper (LHD) and about 7 MT through manual Bord and Pillar method.



Figure 6.7.2.1 Mechanised extraction of coal with Longwall Mining with Powered Support and Shearer at a coal mine in Jharia coalfield. (Source: Coal Memoir, a publication of CIL)

In CIL, out of the 273 underground mines, 227 mines are operating under various methods such as, fully mechanized PSLW packages, Shortwall packages, CM with Mass Production Technology, Semi-mechanized bord and pillar mining with LHD & SDL and mechanized with mixed loading. Remaining mines which are not yet mechanized are in the process of mechanization. As on 31 March 2011, the Company was having 646 SDL, 331 LHD, six Road headers, six (two hired) Continuous Miners, four Power Support Long Wall, two Short Wall equipment.

Audit observed that:

- The 'Manual Bord and Pillar' technology has been the root cause of losses in underground mines.
- Underground mines take about five to seven years to reach production stage which results in escalation of project costs, increased financial risks and poor cash flow.
- The gestation period can be drastically reduced by shaft³³ sinking method.

While admitting the facts, the Company stated (September 2011) that intermediate technology like SDL, LHD and higher degree of mechanisation like Continuous Miner technology has been introduced in identified subsidiaries of CIL but they were facing problems in getting surface rights due to thick population or industrialisation on coal bearing areas. Further, there is a shortage of drifting agencies³⁴ of repute in the country who have not been able to develop indigenous expertise for manufacturing underground mining machineries and still rely on imports.

6.7.3 Inordinate delay in opening up of deeper horizons in Jharia Coalfield

Bulk of the coking coal production of CIL comes from Jharia coalfield of BCCL. The Technical Group formed by MoC in May 1993, on the Action Plan for reducing dependence on coking coal imports stated that in the long-term (Tenth Plan and beyond) the production from the existing coal mines would start declining and there would be a need for making good the loss of production by opening up deeper horizons in the Jharia Coalfield. As per the geological assessment, there are 4,000 MT of good quality of coking coal resources in deep seated explored blocks in Parbatpur (GR:231.32 MT), Mahal (GR: 258.35 MT), Sitanala (GR: 108.80 MT) of BCCL and a part in TISCO leasehold area.

Scrutiny of records in Audit revealed the following :

- The Parbatpur, Mahal and Sitanala blocks were de-reserved from CIL by MoC and allocated to Electrosteel Castings Limited, Rastriya Ispat Nigam Limited and Steel Authority of India Limited in July 2005, December 2005 and April 2007, respectively. The Mahal block was de-allocated (March 2011) due to non-adherence to the terms of allotment by the allottee even after a lapse of more than six years. However, the same was not re-allocated by MoC to CIL/BCCL till date (November 2011).
- The production from Parbatpur block started through open cast mining from December 2008 by the allottee but the production was 0.13 MT, 0.55 MT and 0.34 MT during the

³³ Method of excavating a vertical or near-vertical tunnel from the top down, where there is initially no access to the bottom

³⁴ Agencies who carry out the work of shaft sinking

period 2008-09, 2009-10, 2010-11, respectively. The Company has already started underground mine construction work like inclined drive and shaft sinking and expected that commercial production will start by 2011-12.

- Sitanala blocks were yet to commence their production even though their normative date of production was April 2011.

Thus, even after a lapse of 18 years, the suggestion of the Technical Group to produce from deeper horizons of Jharia coalfield by and large remained unfulfilled (February, 2012). incidentally, Electrosteel casting Limited could start production in Parbatpur block within three and half years from the date of allocation of the block.

The Ministry stated (February 2012) that production from deeper horizons of Jharia Coal Fields could not be started due to age-old problems of fire hazards, waterlogged upper seams and delay in implementation of Jharia Action Plan. Further, MOC added that there is no such concept of correct mix of opencast and underground mining *per se*. The mineability of a given coal deposit depends on the techno-economic feasibility and the method of mining of the deposit gets decided by this criteria. The opencast mines are being planned even upto 500 mtrs. and the focus on opencast mining with appropriate technologies would continue for quite sometime into the future. However, planning for construction of deep underground mines is also under consideration adopting mass production technologies like the 'Longwall' mining and the 'Continuous Miner' technology. Since, construction of underground mines involve long gestation period particularly for creating access ways either through shaft sinking or through drift drive advance action for creation of the infrastructure in the identified deep seated blocks is being focused upon.

Though the contention of the Ministry is acceptable, for sustainable coal production over a longer period of time, there is a need for proper mix of taking up both opencast and underground projects considering the geo-mining condition and techno-economic feasibility of a project.

In essence, in order to augment coal production, CIL should aim for a proper mix of open cast and underground mining, and with greater mechanization. The production from underground mining has stagnated and CIL would have to produce from deeper horizons of Jharia coalfield. This would also help to reduce the gap between demand and domestic supply in respect of coking coal where the domestic production is progressively declining. For open cast mining, CIL and its subsidiaries should correctly assess the actual backlog in overburden removal and expedite its removal for better production performance.

6.8 Washing of Coal

Indian coal contains higher percentage of ash (mineral matter) as compared to coal of major coal exporting countries like Australia, South Africa and Indonesia due to its drift origin, by which impurities get embedded in the coal matrix. Hence, washing of coal becomes necessary to ensure a more consistent fuel supply to the steel (coking coal) and power (non-coking coal) sectors.

6.8.1 Coking coal washeries

As per the report of the Working Group on Coal and Lignite for formulation of the Eleventh Plan, the projected output of washed coking coal was kept at 12.56 MT (7.52 MT for CIL) for 2011-12.

Audit noticed that:

- Although the existing 12 coking coal washeries of CIL located at BCCL, CCL and WCL had a total capacity of 22.18 MTY, they could produce only 3.81 MT, 3.83 MT, 3.68 MT, 2.97 MT and 3.19 MT of washed coal during 2006-07, 2007-08, 2008-09, 2009-10 and 2010-11 respectively.
- The yield ratio (ratio of raw coking coal feed to washed coking coal produced) for CIL washeries ranged between 40.53 to 53.04 percent.
- The low capacity utilisation of the washeries and poor yield ratio was mainly because of deterioration in raw coal quality due to depletion of good quality upper seam coal and outdated life of the washeries.
- There were delays in modernisation of the washeries.

6.8.2 Non-coking coal washeries

The Planning Commission estimated that 243 MT per annum of thermal coal would be required to be washed in 2011-12. Accordingly, about 140 MT per annum of additional thermal coal washing capacity was required to be created by 2011-12.

CIL has five non-coking coal washeries at BCCL, CCL and NCL, which are designed to produce only about 17.22 MT of washed non-coking coal. These washeries produced 10.31 MT, 10.46 MT, 11.28 MT, 11.62 MT and 12.39 MT of washed non-coking coal respectively for the period from 2006-07 to 2010-11. The yield ratio of these washeries ranged between 81 to 99.05 percent.

The contribution of private non-coking coal washeries had been 2.37 MT, 2.23 MT, 30.45 MT, 27.71 MT and 22.63 MT for the period from 2006-07 to 2010-11, respectively.

6.8.3 Delays in setting up of washeries

CIL decided to set up 20 coal washeries with a total throughput capacity of 111 MT per year of which six were coking coal washeries with a total capacity of 19.1 MTY and 14 were non-coking washeries with a total capacity of 92 MTY. The estimated expenditure on these washeries was ₹ 2,327.50 crore. The washeries were to be developed on 'Build Operate and Maintain' mode. CIL's efforts for proposed augmentation of production of washed coal were still under agreement stage with the operators (November 2011).

These delays are benefitting the private washeries at the cost of CIL. The case of SECL is discussed below to highlight the same.

SECL is the highest producer of coal among the subsidiaries of CIL. There are 11 private washeries operating in the command area of SECL with a total capacity of 45.45 MTY. Dipka open cast project produced 24.04 MT of coal during 2010-11 and supplied 17.50 MT to two private washeries meeting almost 100 percent of their capacity. One washery of 12 MTY capacity is situated inside the leasehold area of SECL, the other washery of 6 MTY capacity is located outside the leasehold area. Despite private washeries being in operation in SECL areas with huge profits (payback period is less than a year), the Company took decision to set up washeries in June 2007 i.e. nine years after allowing private washeries in their command area. Two washeries were to be set up at Kusmunda and Baroud at an estimated cost of ₹ 202.51 crore and were to be completed by December 2011. Due to change of capacities and delays in identification of land, the washeries are now scheduled for completion in July 2014 (Kusmunda) and April 2015 (Baroud).

Audit observed that the profit foregone due to delay in setting up of Kusmunda Washery alone worked out to ₹ 750 crore.

The Ministry stated (February 2012) that the major reasons causing delay in implementing the washery projects are delay in getting forestry clearance for land from MoEF, long time required in land acquisition, delay in getting environmental clearance for the projects from MoEF, re-tendering of different projects, long time for evaluation of tender offers for different projects due to non submission of desired details from the bidders

The Ministry inter-alia stated (February 2012) that 5 non-coking coal washeries are producing about 11 million tonnes of clean non-coking coal. In addition to the washeries of CIL for non-coking coal washing, 27 non-coking coal washeries with a total throughput capacity of 78.74 million tonnes per annum are operational in the private sector and produced 20.93 million tonnes of washed non-coking coal in 2010-11 implying a capacity utilization of about 26 per cent only. Thus, there is surplus capacity available in the private sector for washing thermal coals which can be utilized by the consumers particularly the power sector.

In sum, it is thus evident that a total non-coking washed coal produced in the country during 2010-11 was only 33.32 MT which was much below the requirement of 151 MT (11 MT + 140 MT) as desired by the Planning Commission in the terminal year of Eleventh Plan.

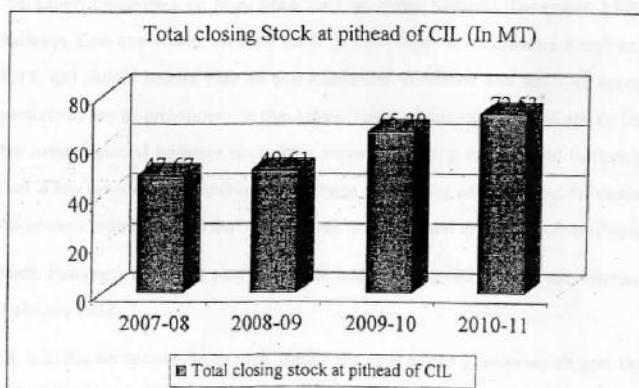
As Indian coal contains higher percentage of ash, washing of coal is of utmost significance, both for the efficiencies in the user plants and from the point of view of environmental concerns. Washing also fetches higher prices and profits. In fact, the capacities for washing of non-coking coal are grossly inadequate in CIL subsidiaries and there have been inordinate delays by CIL in setting up of washeries. The gap in capacities is being partially fulfilled by the private washeries. CIL and its subsidiaries should expedite setting up of non-coking washeries.

6.9 Transportation of Coal

The major modes of transport of coal by the CIL subsidiaries are railways, roads and MGR³⁵. The details of despatch of coal by the railways and road by the CIL subsidiaries during the Eleventh Plan period are detailed in Charts 1.7.1 and 1.7.3 in Chapter 1. Transportation of coal has been a significant hindering factor in supply of coal by the CIL subsidiaries, which has resulted in slower off-take and accumulation of coal stock at pit head.

The closing stock at pit head in CIL subsidiaries in the Eleventh Plan period (up to 2010-11) is detailed in Chart 6.9.

Chart 6.9



³⁵ Merry Go Round

As would be seen from the above, the closing stock at pit head progressively increased over the years. As on 31 March 2011, 90 per cent of the coal stock accumulated in 75 mines (including four major open cast mines at Gevra, Dipka and Kusmunda of SECL and Jayant of NCL).

The main reasons for huge accumulation of stock were attributed by the Management to:

- Less supply of rakes by the railways.
- Inadequate transport facilities in mines.
- Lack of coal handling and loading infrastructure at mines.
- Non availability of adequate coal stocking infrastructure at the customers' end.
- Off take by the consumers was lower than the anticipated demand

Audit also observed that during the period from 2006-07 to 2010-11, there was a shortage of 25.60 lakh tonne valuing ₹ 130.60 crore in different subsidiaries, where the shortage was beyond 5 per cent of the closing stocks (the cut-off per cent for accounting purposes). Apart from this, there was also a shortage of 37.45 lakh tonne of coal valuing ₹ 169.20 crore within 5 per cent of the closing stocks.

NCDP 2007 envisaged that as and when FSAs came into existence, both parties viz. coal companies and the consumers would endeavour to enter into Fuel Supply and Transport Agreement (FSTA) which would be a tripartite agreement involving the supplier, the coal consumer and the logistic provider i.e. the railways. The FSTAs would firstly be made applicable to major consumers like those in the power, cement, and steel sectors and could be extended to other consumers in a phased manner.

The Expert Committee on Road Map for Coal Sector Reforms (December 2005) opined that the Railways, Coal and Power Ministry have to work together to draw up a well-conceived model of FSTA. GoI should ensure that all the concerned Ministries and agencies accept the FSTA and perform as per its provisions. In the Action Taken status report, MoC stated (January 2012) that the extant rules of Railways have little room for arriving at FSTA and further it was mentioned that a few private power stations have been negotiating with Railways for signing Fuel Transport Agreement separately and that FSTA is yet to be finalised at Inter Ministerial levels.

Audit however, observed that no FSTA had been signed by the subsidiaries of CIL till date (February 2012).

CIL subsidiaries receive assistance under the Coal Mines (Conservation and Development) Act, 1974 (CCDA) which, *inter alia*, includes assistance for construction of roads and railways infrastructure. CCO collects Stowing Excise Duty (SED) on all raw coal produced and dispatched from all the collieries in India and grants assistance under CCDA for various infrastructure works undertaken by the collieries including construction of roads and railways infrastructure. The CCDA assistance was brought under plan expenditure in the Eleventh Plan.

The Ministry stated (February 2012) that Indian Railways have already indicated that they would not be entering into any tri-partite agreement for Fuel Supply and Transportation Agreement. As such implementation of FSTA, as envisaged in the NCDP, is a remote possibility now. However, there is institutional mechanism for co-ordination with railways for increasing supply of rakes at sidings. It was further stated that capacity increase of MGR is dependent on the timely execution of the project by the captive consumers and there is limited scope for capacity expansion in case of belt/ropeways. Wherever, possible CIL tries to make good the shortfall in rail by augmenting dispatch through road.

In view of the facts stated by the Ministry, the coal companies should explore the possibilities to increase dispatch of coal by road and by MGR wherever possible. Also there is a need to address the bottlenecks for implementation of FSTA through inter-ministerial committee.

In fact, CIL should ensure

- Besides entering into FSTAs, CIL and its subsidiaries should coordinate efforts with Railways for increasing supply of rakes at sidings. They should also increase off-take of coal by MGR and road to bring down the pressure on despatch through railways.
- The disbursement of CCDA assistance is to the maximum so that the growth in transport infrastructure matches the growth in coal production.
- CIL and its subsidiaries should periodically verify and reconcile the closing stock to ensure that these stocks actually exist.

6.10 Equipment

The major equipment used in coal mining are Heavy Earth Moving Machineries (HEMM) like drills, shovels, dumpers, dozers and draglines, which are used for extraction of coal and removal of overburden (OB) in open cast mines. Drill is used to create boreholes for blasting. Shovels excavate the coal/OB and put the same into dumper for transportation. Dragline is used for direct handling/re-handling of OB material. The technologies and associated equipment used in underground mining have already been discussed in paragraph 5.7.

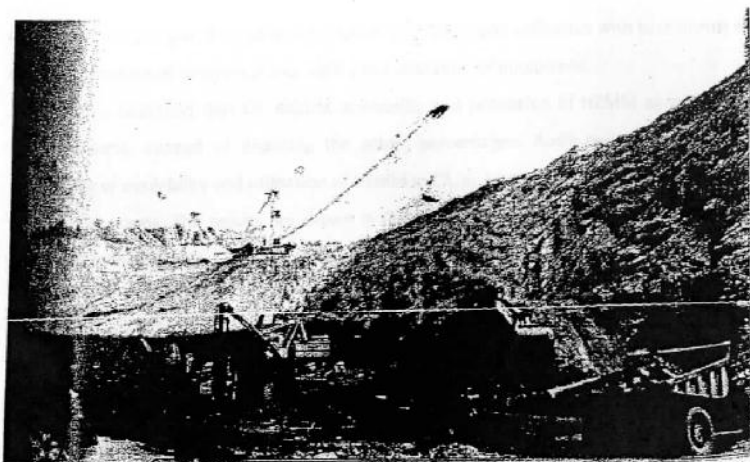


Figure 5.10.1 Heavy Earth Moving Machineries (Draglines, Shovels, Dumpers and Dozers) at a large Open Cast Mine in Singrauli Coalfield (Source: Coal Memoir, a publication of CIL).

6.10.1 HEMM population

In order to achieve the original Eleventh Plan target of 520.50 MT of coal production by CIL in 2011-12, MoC envisaged a certain population of HEMM for CIL in its Report on 'Overview on Coal Industry in India' (June 2007). Actual population of HEMM in CIL during 2006-07 to 2010-11 vis-à-vis those envisaged by MoC is given in Table 6.10.1 below.

Table 6.10.1
HEMM Population

Name of equipment	As on 31 March 2007	As on 31 March 2008	As on 31 March 2009	As on 31 March 2010	As on 31 March 2011	Population envisaged by MoC as on 31 March 2012
Dragline	41	41	40	40	40	119
Shovel	686	687	703	747	754	843
Dumper	3364	3240	3293	3366	3217	3555
Dozer	989	998	1025	991	981	805
Drill	696	744	754	713	709	655

As would be seen from table 6.10.1, there is significant shortfall in the population of Dragline, followed by Shovels and Dumpers. The population of Dumpers and Dozers are on the decline.

6.10.2 Low Availability and Utilization of HEMM

The norms for availability and utilisation percentage of HEMM are fixed by CMPDIL, which was fixed way back in 1986 and have not been revised till date (November 2011). With the improvement in technology and consequent improvement in efficiencies in the performance of